Does Students' Loan Amount affect Choice of Program of Study? Evidence from Privately Sponsored Undergraduate HELB Loan Recipients in Kenyan Public Universities

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Abstract
This study sought to establish the effect of HELB loan amount on the choice of program of study by privately sponsored undergraduate students in public universities in Kenya. The study was conducted with the aid of a representative sample of 517 respondents proportionately drawn from the 2012/2013 cohort of privately sponsored HELB loan recipients in three public universities in Kenya. Using multinomial logistic regression, the study established no significant relationship between HELB loan amount and choice of programme of study by privately sponsored undergraduate students in public universities. This was attributed to the very low amounts of loan awarded to students relative to tuition fees charged. The study therefore recommends that HELB should increase loan amount and review the loan award criteria so as to factor in the cost of tuition for each program of study while awarding loans to individual privately sponsored students in public universities.

1.0 INTRODUCTION
1.1 Background to the Study
Participation in higher education in Sub-Saharan Africa is by far the lowest in the world. For instance, enrolment rate at higher institutions of learning in the region stands at only 7% against the world's 29% (Oketch, et al, 2014). Furthermore, despite decades of policies designed to increase not only the number of young people entering higher education, but also the proportion of students from lower socio-economic backgrounds and other under-represented groups in the region, available statistics indicate that in many countries, participation in higher education is still dominated by students from the highest income quintiles (Kasozi, 2009; Boit, 2012).

In Kenya specific, higher education inequality between the 'haves' and 'have-nots' is overwhelmingly high (Keriga & Bugira, 2009). Most of the limited capacity in both public and private universities is filled up by students from high and middle socio-economic backgrounds (Owino, 2003; Otieno, 2007, Odebero, 2007). Moreover, even where students from low socio-economic status got opportunity to join the public universities, enrolment in competitive programmes in the areas of Science, Technology, Engineering and Mathematics (STEM) appeared to be heavily skewed in favour of students from medium and high socio-economic backgrounds

(Odebero, 2008). This is because the public universities' joint admissions criteria is quite restrictive and favour the sons and daughters of wealthy families, who attend elite secondary schools and therefore get higher grades which guaranteed them university admissions to competitive programmes of study at the expense of their counterparts from low income families (Otieno, 2004).

The situation has further been complicated by the introduction of cost sharing between the government and students in financing public higher education and the liberalization of higher education where privately sponsored students meet full program costs and living expenses (Salmi, 2010). Consequently, due to their limited purchasing power students from low income backgrounds are more sensitive to price changes than their counterparts from high income families (Heller, 1999). As such, in a free market situation, students from low socio-economic backgrounds are less likely to participate in high cost and competitive programmes of study such as STEM (Koen & Frank, 2015; Odebero, 2008).

Be that as it may, demand for higher education is strongly associated with among other factors, expected economic and employment prospects associated with different educational levels and areas of specialty. Other factors remaining constant, a majority of prospective students would therefore prefer to enrol into programs that are associated with higher returns (Muthui, 2013; Menon, 1999). However, studies show that graduates of STEM programs are more likely to earn higher incomes and get more opportunities than their counterparts from other disciplines (Dickson & Harmon, 2011; O'Leary and Sloane, 2005; Blundel et al, 1999). As such, majority of the prospective students would ordinarily wish to be enrolled into STEM programs.

It is against this backdrop that the government of Kenya expanded the scope of Higher Education Loans Board (HELB) to cover privately sponsored students in public universities so as to enable students from lower socio-economic backgrounds to participate in an appropriate form of higher education, without unacceptable deprivation, work schedule, or sacrifice (http://www.helb.co.ke).

Apart from their ability to relieve pressures on national budgets by facilitating greater cost sharing (Psyachopolous and Patrinos, 2004), student loans have the potential of increasing access and participation in higher education by students from low socio-economic backgrounds (Salim, 2010; Munavu. et al, 2008). In fact, there is considerable literature on the link between students' aid and participation in higher education as measured by enrolment rates. Studies have however given mixed results as to the extent to which subsidised loans have had significant effect on student enrolments. On one hand, Dynarski (2000), Lauer (2000) and Yusif & Yussof (2010) show a positive and significant impact of student loan on higher education enrolment. On the other hand, the findings of Baumgarter and Steiner (2006) and Neill (2008) indicate that student aid is ineffective in raising enrolment rates.

1.2 Purpose of the study
This study sought to establish the effect of   HELB loan amount on choice of program of by privately sponsored undergraduate students in public universities in Kenya.

1.3 Hypothesis
Ho$_1$: HELB loan amount has no statistically significant effect on the type of program of study privately sponsored undergraduate students pursue in public universities in Western Kenya.

1.4 Limitations of the study
Data was collected from the privately sponsored HELB loan recipients themselves. There was no home visitations and document analysis of official records. However, the respondents were assured of their confidentiality so as to provide accurate information.

2.0 METHODOLOGY

2.1 Study Sample

This study was conducted with the aid of a sample of 517 respondents proportionately drawn from the 2012/2013 cohort of privately sponsored HELB loan recipients in three public universities in Kenya. The universities selected were: University of Eldoret (UoE); Jaramogi Oginga Odinga University of Science and Technology (JOOUST); and, Masinde Muliro University of Science and Technology (MMUST). In order to ensure sample representativeness of the entire population, the 2012/2013 cohort of privately sponsored undergraduate HELB loan recipients in the three universities were grouped into three broad strata of STEM, Education, Arts & Social Sciences, and Economics & Business related disciplines. Thereafter, the number of respondents from each stratum was determined using stratified proportionate to size procedure as shown in Table 3.1

Table 1: Sample of Privately Sponsored HELB Recipients

University	STEM		Education, Arts and Social Sciences		Economics and Business		Total Population	Sample size
	Population	Sample	Population	Sample	Population	Sample		
UoE	202	52	288	74	222	57	712	183
JOOUST	29	7	119	31	60	16	208	54
MMUST	151	39	823	211	117	30	1091	280
TOTAL	382	98	1230	316	399	103	2011	517

Source: Population of Privately Sponsored HELB Recipients mapping data, 2015, p. 33
Simple random method was thereafter used to select individual student respondent from among the 2012/2013 cohort of privately sponsored undergraduate HELB loan recipients from the three strata of STEM, Education/Arts/Social Sciences and Business/Economics in the three public universities.

2.2 Data Collection Method

This study used self-completing questionnaire to obtain information on the independent, dependent and control variables from the sampled 2012/2013 cohort of privately sponsored HELB loan recipients. In specific, the students were required to respond to array of questions related to the amount of HELB loan awarded per year, type of program of study, socio-economic status, KCSE performance and name of the university. A total of 455 questionnaires were returned out of the 517 administered. This provided a response rate of 88.008% which was considered adequate for data analysis (Oso and Onen, 2005).

2.3 Data Analysis

Multinomial logistic regression analysis was used to model the relationship between HELB loan amount and type of program of study pursued by privately sponsored undergraduate students, while controlling for respondents' characteristics and university of study. The justification for choice for multinomial logistic regression was in fact that it enabled sequential regression of the relationship between the dependent and independent variables while controlling for student-level characteristics and university factor. As such, three sequential regression models were developed. The first model fitted the association between student's program of study (the outcome variable) and Mean HELB loan allocation (independent variable). The second

model controlled for individual student respondent's characteristics while the third model controlled for both the respondents' characteristics and institutional factor.

However, prior to modelling, pair-wise correlation and chi-square were used to correlate the outcome variable (type of program of study) with all possible continuous and categorical explanatory variables respectively with the view of determining which plausible interactions to pursue in the regression models. The null hypothesis was rejected at 5% if the significance was less than alpha=.05. Only variables which had significant relationship with the dependent variable were pursued further in the regression analysis.

The results of pair-wise correlation showed that only mean HELB loan amount and academic performance at KCSE were the only statistically significant continuous explanatory variables. See *Appendix I.* On the other hand, the results of chi-square test showed that student's sex, socio-economic status, highest educational attainment of head of household and university were the only statistically significant categorical variables. This information is contained in *Appendix I*

3.0 FINDINGS AND DISCUSSION
3.1 Descriptive statistics of HELB loan Amount Award
The mean, median, mode, range, standard deviation, minimum and maximum amount of HELB loan awarded to the sampled privately sponsored HELB loan recipients were established. The findings are presented in Table 2.

Table 2: Descriptive statistics of HELB loan amount

Amount of HELB loan awarded per year	
Mean	40207.69
Std. Error of Mean	304.908
Median	37000
Mode	35000
Std. Deviation	6503.917
Range	25000
Minimum	35000
Maximum	60000

Data in Table 2 indicate that the students who got the highest amount of HELB loan received Ksh. 60,000, while the ones awarded the least amounts got Ksh. 35,000. However, the mean amount awarded to privately sponsored undergraduate students in the public universities was Ksh. 40,207.69. In fact, most recipients were only awarded Ksh. 35,000. The mean HELB loan award was equivalent to only 36.56 % of the cost of tuition per annum for the least expensive category of programmes in Education, Arts and Social Sciences in the public universities. The implication is that the students had to look for other sources of financing to bridge the gap between the amount of loan awarded and tuition fees charged. These findings point to the fact that HELB loan is indeed an inadequate mode of financing higher education for the majority poor who do not have reliable alternative financing mechanisms. The findings of this study are in line with those of Otieno (2004), Nafukho (2001) and Standa (2000) which observed financial hardship among university students in Kenya and attributed it to inadequate financing.

3.2 Effect of HELB Loan Amount on Choice of Program of Study

The results of the three sequential models are presented in Table 3.

Table 3: Multinomial Logistic Regression for the Association between Student's Programme of Study and HELB Loans (2012/13-2015/16 AYs)

Variable	Variable label	1=Science Technology Engineering Medicine Verses Education, Arts and Social Sciences						3=Economics and Business Verses Education, Arts and Social Sciences					
		Model 1 (a31)		Model 2 (a31)		Model 3 (a31)		Model 1 (a31)		Model 2 (a31)		Model 3 (a31)	
		RRR	*P*	RRR	*P*	RRR	*P*	RRR	*p*	RRR	*P*	RRR	*P*
a22	a22= Mean HELB loan allocation 2012/13-2015/16	1	0.002	1	0.337	1	0.378	1	0.048	1	0.282	1	0.21
mcases31	mcases31=Low ses			1.79	0.109	1.85	0.1			1.495	0.241	1.41	0.344
mcases33	mcases33=High ses			0.43	0.104	0.53	0.248			1.89	0.073	3.12	0.003
a12	a12= Male student=1			1.52	0.197	1.67	0.124			1.584	0.074	1.55	0.103
a21	a21= Yes, HELB is main financier=1			4.15	0	4.13	<.001			1.244	0.441	0.85	0.592
a34	a34= KCSE score 6=C - 12=A			2.58	0	2.68	<.001			1.344	0.006	1.11	0.383
a41	a41= Student never misses lectures=1			2.72	0.002	2.93	0.002			1.508	0.117	1.38	0.26
a462	a462= 1=Primary 0=Otherwsise			0.07	0.019	0.07	0.017			0.633	0.306	0.44	0.076
a463	a463= 1=Secobdary 0=Otherwsise			0.57	0.228	0.56	0.224			0.755	0.42	0.57	0.113
a466	a466= 1=Postgraduate 0=Otherwsise			1.57	0.426	1.84	0.298			0.637	0.517	0.58	0.458
a111	a111 1=UoE 0=Otherwise					1.78	0.337					2.85	0.013
a113	a113 1=MMUST 0=Otherwise					1.87	0.286					0.43	0.038
Constant		0.04	<.001	0	<.001	0		0.08	0.001	0.01	<.001	0	0.01
N		455		455		455		455		455		455	
LR chi2(df); Value		(2) 10	0.006	(20) 202	<.001	(24) 241	<.001	(2) 10	0.006	(20) 202	<.001	(24) 241	<.001
Pseudo R^2		0.0117		0.2303		0.275		0.0117		0.2303		0.275	

Note. LR=Likelihood Ratio; df=degrees of freedom; Ays=Academic Years; RRR=Relative Risk Ratio

Source: Stata Output, 2017

In model one, while holding other factors constant a multinomial regression analysis was run to establish the relationship between HELB loan amount and a student's likelihood of studying STEM or Economics/Business related disciplines over Education, Arts and Social Sciences. As shown in Table 3, HELB loan amount had some relationship with the type of program of study for the 2012/2013 cohort of privately sponsored students in public universities in Kenya. In specific, a one unit increase in mean HELB loan allocation increased the relative risk ratio of studying STEM or Economics/Business by 1.00053 times (p=0.002) and 1.000036 times (p=0.048) respectively against the relative risk ratio of studying Education, Arts and Social Sciences. Furthermore, the constants for the model were statistically significant as was the overall model (p=0.006 with a pseudo R2=.0.0117). However, model one only explained 1.17% of the variability of the response data around its mean.

Furthermore, mean HELB loan allocation became statistically insignificant (p=0.337, p= 0.282 respectively) in both scenarios of STEM over Ed, A & SS and Economics/Business related disciplines over Ed, A & SS when student-level characteristics were controlled for in the second model. However, the constants in both scenarios of STEM over Ed, A & SS and Economics/Business related disciplines over Ed, A & SS were significant (p<.001) as the overall model p<.001 with a pseudo R^2=0.2303. This implies that that the model explained 23.03% of the variability of the response data around its mean.

The increased ratio of pseudo R^2 in model two of=0.2303 from 0.0117 in the first model points to the fact that type of program of study was associated with the student characteristics. In specific, the relative risk ratio of studying STEM programmes over Education, Arts and Social Sciences increased by 4.148306 times (p=0.001) for students who indicated that HELB was their main financier. However, this relationship was not statistically significant for the same group of students when it comes to studying Economics and Business related disciplines over Education, Arts and Social Sciences which was the reference category.

The model further explains that one point increase in KCSE performance (7-12) increased the relative risk ratio of studying STEM over Education, Arts and Social Sciences by 4.148306 (p<.001). The same relationship was not significant in the Economics and Business model where a one point increase in KCSE (7-12) was associated with studying Economics and Business related disciplines over Education, Arts and Social Sciences by 1.344497 (p=0.006). The findings point to the fact that academic performance at KCPE remains an important predictor for choice of STEM for students even under self-sponsored mode of study where entry requirements are lower compared to what their government sponsored counterparts are treated to. This finding can be attributed to the fact that STEM programs by their very nature require high level of intellectual capability. As such, even when opportunity was availed, students who did not score well at KSCE shied away from STEM programs.

Interestingly, students from households with head who only attained primary education compared with those with other educational attainments had a reduced relative risk ratio of .07452 (p=0.019) times of studying STEM programmes over Education, Arts and Social Sciences. This means that this group of students were more likely to study Education, Arts and Social Sciences than they were to study STEM programmes. However, this relationship wasn't statistically significant for the same group of students when it came to studying Economics and Business disciplines over Education, Arts and Social Sciences. These findings on reduced relative risk ratio of studying STEM over Education, Arts and Social Sciences for students from households with head who have attained primary education point to the important role of educogenics in demand for education. Educogenics refers to a situation whereby a strong family background in education positively affects the academic achievement of the offspring's. Generally, children born in homes where family members have good education are more exposed and would naturally aspire to do well in school.

Consequently, such children would tend to demand for more and better education (Psachoropoulos & Patrinos, 2004; Gravenir et al, 2005; Ayot & Briggs, 1992).

However, socio-economic status and gender were found to be insignificant in predicting the likelihood of a student pursuing STEM programmes or Economics and Business disciplines over Education, Arts and Social Sciences. The findings of this study contradict those of Odebero (2008) which observed that access to competitive programmes of study was a function of one's socio-economic class. The study showed that apart from educational and art based courses which attracted students from across the board, other programmes had an inclination towards ones' social class. In specific, the study established that enrolment into technology, commercial related courses and medicine was greatly skewed towards middle and high socio-economic classes. It is important to note that Odebero (2008) was conducted among the government sponsored undergraduate students in public universities whose placement into specific type of programme of study is done by a central placing body known as Kenya Universities and Colleges Central Placing Services (KUCCPS). The current study on the other hand was undertaken among the undergraduate privately sponsored students who choose their programme of study by themselves.

As such, the reason for variance in the findings of the two studies could be attributed to the influence of school type which is an important predictor of programme of study among the group of students that Odebero (2008) investigated. This position is supported by Otieno (2004). The study shows that the public universities' joint admissions criteria favour the sons and daughters of wealthy families, who attend elite secondary schools and therefore get higher grades which guaranteed them university admissions into competitive programmes of study at the expense of their counterparts from low income families.

In the third model, while controlling for both student level characteristics and university of enrolment multinomial logistic regression was conducted to estimate the relationship between mean HELB loan amount and a privately sponsored student's likelihood of studying STEM or Economics/Business related disciplines as compared to Education, Arts and Social Sciences. The findings show that mean HELB loan allocation was still statistically insignificant (p=0.378, p=0.210) respectively in both scenarios of STEM over Ed,A &SS and Economics/Business related disciplines over Ed,A &SS.

However, the constants in both scenarios of STEM over Ed,A &SS and Economics/Business related disciplines over Ed,A &SS were significant, as well as the overall model, p<.001 with a pseudo R^2 =0.2750. This implies that the model explained 27.50 % of the variability of the response data around its mean.

Be that as it may, the relative risk ratio of students whose HELB is main financier studying STEM programmes over Education, Arts and Social Sciences increased by 4.131078 times (p<.001). Besides, a one point increase in KCSE (7-12) increased the relative risk ratio of studying STEM over Education, Arts and Social Sciences by 4.148306 (p<.001). The same relationship was significant in the Economics and Business model where a one point increase in KCSE (7-12) was associated with studying Economics and Business related disciplines over Education, Arts and Social Sciences by 1.344497 (p=0.006). On the other hand, the relative risk ration of studying STEM programmes over Education, Arts and Social Sciences for students from households with heads who had attained primary education as the highest level of education decreased by .07452 (p=0.019) times.

The increased pseudo R^2 of 0.2750 in model 3 from a pseudo R^2 of =0.2303 in the second model points to the fact that type of program was also associated with university of study. In specific, the findings indicate that, the relative risk ratio of studying Economics and Business related disciplines over Education, Arts and Social Sciences for students enrolled in University of Eldoret increased

2.8248 times (p=0.019). However, this relationship was not statistically significant for the same group of students in the STEM verses Education, Arts and Social Sciences scenario.

Contrarily, the findings further indicate that the relative risk ratio of studying Economics and Business related disciplines over Education, Arts and Social Sciences for students enrolled at MMUST decreased 0.406131 times (p=0.025). This relationship was however not statistically significant for the same group of students in the STEM verses Education, Arts and Social Sciences model. The findings of this study suggest that university factor plays an important role in students' college choices. These findings are consistent with the findings of McFadden (2015) which observed that college's identity constructs such as geography, cost and reputation are important predictors of student college choice.

In summary, after the three sequential models, post estimation test of hypothesis for logistic regression was undertaken. See *Appendix I*. The findings revealed likelihood-ratio for type of programme of chi^2 (2) =1.83, p = 0.4010, which was not statistically significant at alpha 0.005. The researcher therefore failed to reject the hypothesis. This implied that the data did not support the association between the types of programme of study and HELB loan amounts awarded to privately sponsored undergraduate students in public universities. The findings of this study are at variance with those of a number of studies. Zinderman (2005), for instance showed that student loans play a significant role in increasing educational choices. This position was supported by Heller (2008) which concluded that student loans play a significant role in increasing educational choice because it because it doesn't deter potential student from disadvantaged backgrounds from university participation more than other students, since loan repayment depend on the future ability to pay, rather than current financial circumstances.

Be that as it may, inadequacy of HELB loan to cater for educational needs for university students has been documented (Mwinzi, 2002; Standa, 2000). Therefore, the lack of association between the types of programme and HELB loan amounts in the current study could be attributed to the inadequate amounts of loan awarded to the individual student relative to the cost of such programmes of study. In fact, this study established a mean of annual HELB loan amount of Ksh. 40,207 awarded to the 2012/2013 cohort of privately sponsored undergraduate students in the public universities. This amount of loan award was equivalent to 36.56 % of the cost of tuition per annum for the least expensive category of programmes in Education, Arts and Social Sciences in the public universities.

4.0 CONCLUSIONS

This study did not find any significant relationship between HELB loan amount and type of programme of study by privately sponsored undergraduate students in public universities. As such, higher amounts of HELB loan were not associated with enrolment into more competitive high cost STEM or Economics and Business related disciplines over Education, Arts and Social Sciences in the selected public universities. This was attributed to the very low amounts of loan relative to tuition fees charged at the universities.

5.0 RECOMMENDATIONS
The following recommendations were made based on the findings of this study.

1) Higher Education Loans Board should review their loan award criteria so as to factor in the cost of tuition for each program of study while awarding loans to individual privately sponsored students in public universities. This will enable students to freely enrol into programme of choice, cost notwithstanding.

2) Higher Education Loans Board should raise the minimum amounts of loan awarded to privately sponsored undergraduate students to match with the general cost of private higher education. This will enable the students to adequately participate in higher education without much personal sacrifices that would compromise their academics.

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APPENDIX I: OUTPUTS

Table 4: Correlation matrix between the outcome variable and its Continuous Explanatory Variables

Variable		a31	a22	
a31		1		
a22	a	-0.044	1	
	b	0.355		
a34	a	-0.332	0.112	1
	b	p<.001	0.017	

Table 5: Chi-square: Association between the Outcome Variable and Statistically Significant Explanatory Variables

Association between	χ^2	Df	*p*	Cramer's V
a31= Student's programme of study verses a111 1=UoE 0=Otherwise	57.3. 7	2	p<.001	0.3551
a31= Student's programme of study verses a113 1=MMUST 0=Otherwise	50.79	2	p<.001	0.3441
a31= Student's programme of study verses mcases31= Low SES	27.17	2	p<.001	0.2444
a31= Student's programme of study verses mcases33= High SES	35.61	2	p<.001	0.2798
a31= Student's programme of study verses a12= Male student=1	6.74	2	p=0.034	0.1217
a31= Student's programme of study verses a21= Yes, HELB is main financier=1	45.77	2	p<.001	0.3172
a31= Student's programme of study verses a41= Student never misses lectures=1	11.77	2	p=0.003	0.1608
a31= Student's programme of study verses a462= 1=Primary 0=Otherwise	10.21	2	p=0.006	0.1498
a31= Student's programme of study verses a463= 1=Secondary 0=Otherwise	8.54	2	p=0.014	0.1370
a31= Student's programme of study verses a466= 1=Postgraduate 0=Otherwise	9.05	2	p=0.011	0.1410

Note. df=degrees of freedom; n=cases with no missing data for the variables; Cramer's V: 0-.19=weak association; .20-.49=moderate association; >.49=strong association; UoE=University of Eldoret; JOOUST=Jaramogi Oginga Odinga University of Science and Technology; MMUST=Masinde Muliro University of Science and Technology; HELB=Higher Education Loans Board

Table 6: Post-estimation Likelihood Ratio Tests

a41	Df	Chi2	P>Chi2	-2*log ll	Res. Df	AIC
Original Model				505.86	442	531.86
a22	1	0.09	0.760	505.96	441	529.96
mcases32	1	6.40	0.011	512.26	441	536.26
a21	1	4.04	0.045	509.9	441	533.9
a311	1	1.00	0.318	506.86	441	530.86
a312	1	2.66	0.103	508.52	441	532.52
a461	1	6.06	0.014	511.92	441	535.92
a463	1	3.28	0.070	509.15	441	533.15
a466	1	1.63	0.201	507.5	441	531.5
a43	1	0.04	0.833	505.91	441	529.91
a52	1	73.98	0.000	579.85	441	603.85
a112	1	6.95	0.008	512.81	441	536.81
a113	1	0.01	0.929	505.87	441	529.87

Note. Terms dropped one at a time in turn; Df=Degrees of freedom; ll=likelihood; AIC